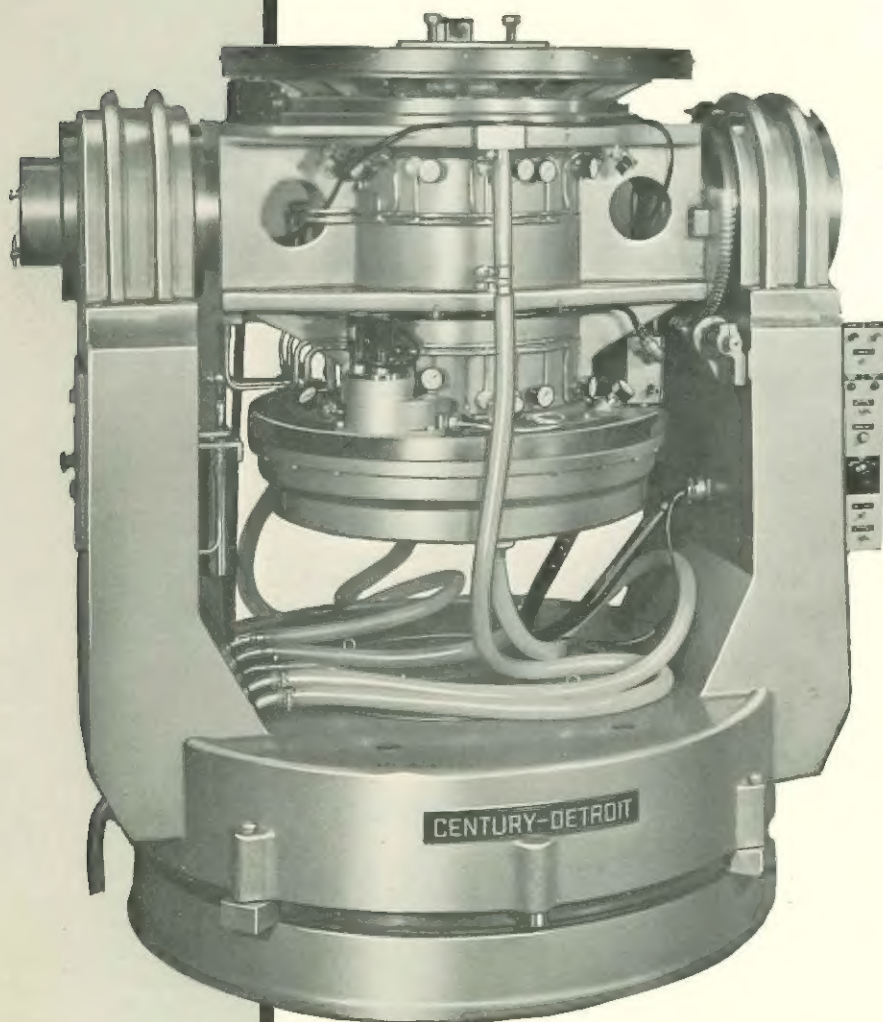


CENTURY-DETROIT

MODEL CD-36-L

ULTRA-PRECISE SERVO/RATE SYSTEM TEST TURNTABLE

HYDRAULIC BEARING TURNTABLE

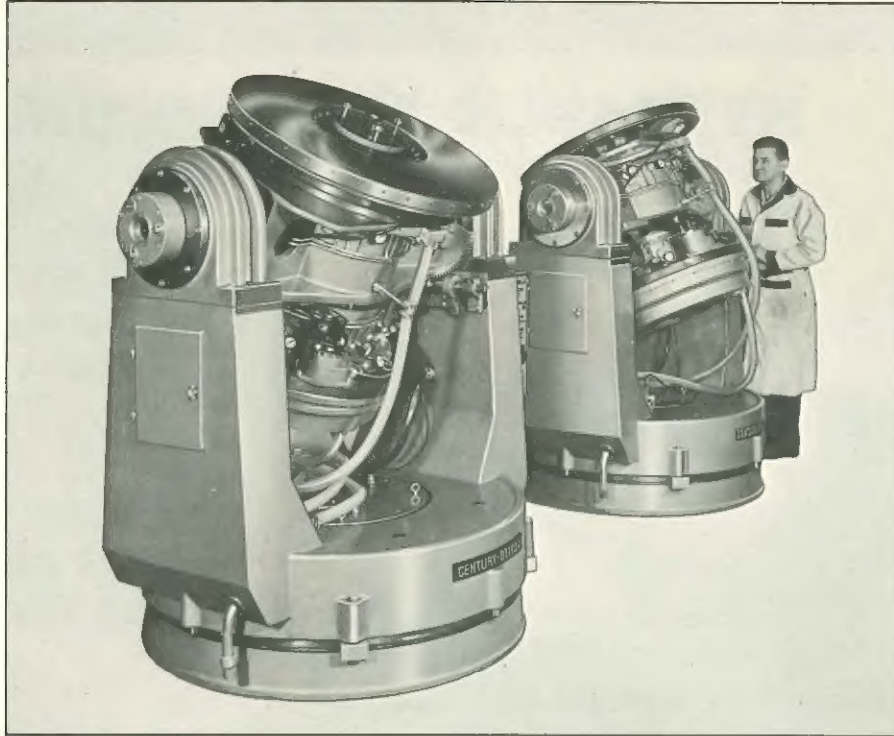


- **MOST PRECISE, RUGGED
AND STABLE SYSTEM
IN EXISTENCE**
- **SEPARATE FLUID POWER
SUPPLY ENSURES FREEDOM
FROM VIBRATION**
- **FULL RANGE VERSATILITY
TO EVALUATE:
COMPLETE INERTIAL SYSTEMS
STABLE PLATFORMS
LARGE BREADBOARD SETUPS
GYROS AND COMPONENTS**
- **MORE IN SERVICE THAN
ALL COMPETING TABLES
COMBINED**

MODEL CD-36-L FEATURING
A FULLY COMPENSATED PRESSURIZED
HYDRAULIC BEARING SPIN AXIS

CENTURY-DETROIT

ULTRA PRECISE SERVO/RATE SYSTEM TEST TURNTABLE



GENERAL

The Model CD-36-L Ultra-Precise Servo/Rate System Test-Turntable Unit is designed and constructed to give the ultimate in accuracy for test and calibration of assembled inertial guidance systems, on-missile inertial measuring units, or large breadboard test setups. It employs Century-Detroit's Fully Compensated, Pressurized Fluid Bearing featuring negligible static friction, very low and exactly reproducible viscous friction, low axial eccentricity and very small planar wobble. Since fluid pressure prevents metal-to-metal contact between bearing surfaces, even during shutdown, the table performance will not deteriorate because of age or wear.

DESCRIPTION

SPIN AXIS

The Test-Turntable spin axis is supported by a Fully Compensated Pressurized Fluid Bearing. The journal and two thrust faces are each supported by rings of eight pressure pockets. The combined effect of thrust and journal pressurization is to hold the spin axis very rigidly in the directions in which movement is not desired but to permit table rotation with very little friction.

A floating-fixed clamp is mounted on the trunnion so that the table top may be clamped in position, and a vernier is attached for fine table top adjustments. A limit switch on the table clamp prevents power rotation during clamp engagement. The table top is furnished in any desired hole or T-slot pattern.

TRUNNION

The trunnion, which also forms the housing of the spin axis bearing, is of a very heavy, rigid, one-piece cast construction. It carries the external pressure manifolds and bearing pocket metering subassemblies, and is internally ported to the drain manifolds. It is supported on four highest-precision tapered roller bearings in a boxed construction, so that tilt axis wobble is minimized. The trunnion is tilted by a power driven worm and worm wheel, and can be clamped and fine-adjusted. Provision is made for various readout devices, as required.

STANCHION & BASE

The stanchion is another very heavy and rigid casting. It is supported on leveling subassemblies which rest on the base in normal operation.

The base section can be set and bolted permanently on the isolation block and leveled. The tilt axis is adjusted to the horizontal by the ball screw subassemblies, and can be rotated in azimuth without readjustment for level.

The tilt axis azimuth alignment is made by pressurizing the lower pads of the leveling subassemblies so that the entire stanchion is floated on fluid bearings. The stanchion, which is trapped on the base by rollers, can then be rotated by finger-touch to the desired azimuth. The final azimuth setting is made by differential screws before the pads are depressurized. When the setting is correct, the system is depressurized and locked.

BEARING

The Century-Detroit Fully Compensated Pressurized Fluid Bearing is based on the principle of compensating the flow rate of bearing medium into and out of the local pressure reservoirs (pockets) while maintaining equal pressure at the pockets. Correct flow rates for each pocket are determined and permanently set at the factory and need not be altered thereafter.

HYDRAULIC POWER UNIT

The hydraulic power unit is of conventional design, employing a motor-driven pump, a balanced piston relief valve, the necessary filters, an accumulator, a water-cooled heat exchanger, the necessary oil temperature controls and a pressure switch to prevent power rotation of the spin axis if pressure is low. It can be located up to 50 feet away from the Test Turntable. Filtration to 40 microns is supplied as standard.

INSTRUMENTATION CONSOLE

The instrumentation console is a conventional modular Emcor electronic relay rack with sliding drawer hardware. Dimensions are 72" high x 18" deep. Width varies with amount of equipment needed.

MATERIAL & FINISH

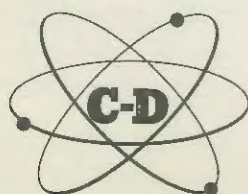
The general material is cast, close-grained completely stabilized Meehanite, providing permanent dimensional stability and low thermal coefficient of expansion. The surface is finished in accordance with good instrumentation practice. Exposed machined surfaces are protected by anodizing, plating, or other appropriate surface treatment. Dissimilar metal contact is avoided or protected by anodizing.

OPTIONAL EQUIPMENT

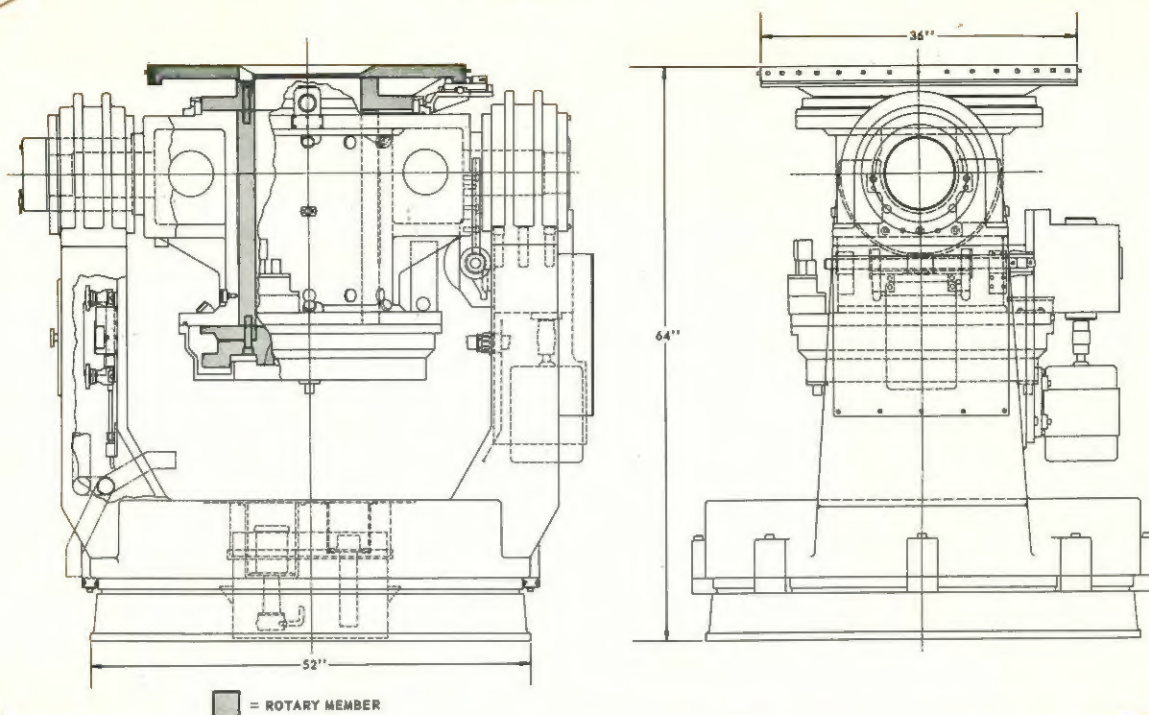
The basic Turntable, Model CD-36-L, equipped with selected variations of the following optional equipment will ensure complete accuracy and flexibility for any desired quality assurance or research and development program involving inertial guidance systems or devices.

- Spin Axis Drive
 - DC, Slotless DC or AC torque motor
 - Table Tracking Microsyn with Bull Gear or Friction Drive
 - Table Tracking Inductosyn
 - Open Loop Synchronous Drive
 - Midarm Rate Control
- Tilt Axis Drive
 - Motor-Driven
- Spin Axis Readout
 - Single or Dual Photoelectric
 - Inductosyn or Multisyn
 - Glass Disc Encoder
 - Midarm
 - Microgon
 - Single or Dual Microscope & Circle
 - Axis Mirror
- Tilt Axis Readout
 - Inductosyn or Multisyn
 - Unisec
 - Bubble Level Cluster
 - Axis Mirror
- Slip Rings
 - Direct Driven
 - Servoed
- Electronic Equipment
 - Gyro Slaving & Rate Mode Electronics
 - Table Servo Amplifier
 - Civil or Sidereal Rate Generator
 - Electronic Position Display
 - Elapsed Time Display
 - Counters, Printers, etc.

CENTURY-DETROIT



Manufacturers of Gyro and System Test-Turntables, Multi-Axis Gimbaling Systems, Base Motion Simulators, Linear and Angular Vibrators, Test Stands, and Specialized Large Linear and Rotary Fully Compensated Pressurized Liquid and Air Bearing Applications For The Aerospace Industry Call Area Code 313, WA 3-8088.



SPECIFICATIONS

GENERAL

Overall Size:

52" dia. x 64" high

Table Diameter:

30" to 42", 36" nominal

Weight:

8000 lbs.

Load Capacity:

Meets specified precision performance at 500 lbs. @ 18" above table top. Up to 3000 lbs. can be carried without damage to table.

Azimuth Adjustment:

360° with Pressurized Fluid Bearing
± 5° Azimuth Vernier and clamp.

Leveling of Tilt Axis:

Ball pads in Stanchion Assembly.

TILT AXIS

Freedom:

± 95° (optional ± 180°)

Bearing:

4 Timken Ultra-Precision Tapered Roller Bearings In Box Construction

Readout:

Choice of Dial, Gurley Unisec or any standard electrical or optical system.

TILT AXIS (Cont'd.)

Leveling Readout:

Bubble Cluster (optional)

Drive:

Power drive standard.
Vernier adjustment and clamp.
Axial Mirror Optional

SPIN AXIS

Wobble:

± 0.5 Sec.

Eccentricity:

± .000025"

Orthogonality of Spin and Tilt Axis:

± 2 Sec.

Freedom:

360° continuous with Slip Rings.
± 360° with Cable Bundle.

Slip Rings:

60 standard-up to 100 optional (Servo-optional)

Open Loop Drive:

Synchronous Motor, 1x, 2x, 4x, 10x,
40x Earth Rate. Any other multiples optional.

Closed Loop Drive:

D.C. Slotless D.C. or A.C. Torque Motor

SPIN AXIS (Cont'd.)

Rate Mode:

Precision Rate Generator and Table Tracking Microsyn, Inductosyn or Midarm Rate Control with loop electronics and offset adjustment.

Servo Mode:

Gyro Preamp, reference amplifier and loop electronics.

Readout

Adaptable to any standard unit such as single or dual photo-optical, Inductosyn, digital encoder, Microgon, Midarm.

HYDRAULIC UNIT

20 gal. tank unit with Vickers pump, balanced piston relief valve, heat exchanger, oil temperature control and electric control.

POWER REQUIREMENTS

2 KVA at 220/440, 3 phase, 60 cycle
2 KVA at 115V single phase 60 cycle